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PERCEPTION OF LIFE CYCLE COSTING IN MALAYSIA GREEN BILDING

NG WAI YOKE

A project report submitted in partial fulfillment of the
requirement for the award of the degree of
Master of Science (Construction Management)

Faculty of Civil Engineering
Universiti Teknologi Malaysia

JULY 2011

I declare that this project report entitled "*Perception of Life Cycle Costing in Malaysia Green Building"* is the result of my own research except as cited in the references. The report has not been accepted for any degree and is not concurrently submitted in candidature of any degree.

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To my beloved parents and friends for their never ending care and support.
Thank you for everything.

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ABSTRACT

Green building is designed to minimize environment and social health effect and at the same time reduces its life cycle cost. However, their application in the Malaysia building industry seems limited according to the list of building certified under Green Building Index. The objective of this report is to investigate the benefits of life cycle costing application in green building, to identify the ways of life cycle costing in optimising the value of money of investor and ownership in green building and to identify the challenges and barriers of life cycle costing application in Malaysia green building. The data were analysed using Statistical Packages for Social Science (SPSS). There are two important results obtained from SPSS analysis, frequency analysis and mean index. The study shows that the benefits and ways of life cycle costing application in green building are significant to promote higher rates of green building construction. While the attitudes and perception of practitioners toward financial benefits of green practices investments are the main reason to the slow adoption of green building developments in Malaysia.

ABSTRAK

Bangunan hijau adalah direka untuk mengurangkan kesan kepada alam sekitar dan kesihatan sosial dan pada masa yang sama mengurangkan kos kitaran hayat. Walau bagaimanapun, penggunaannya dalam industri pembinaan Malaysia seolah-olah terhad dengan merujuk kepada senarai bangunan yang diperakui di bawah Indeks Bangunan Hijau. Objektif laporan ini adalah untuk mengenalpasti manfaat penggunaan pengekosan kitar hayat di bangunan hijau, untuk mengenal pasti cara-cara pengekosan kitar hayat dalam memaksimakan nilai wang pelabur dan pemilikan di bangunan hijau dan untuk mengenal pasti cabaran dan halangan dalam penggunaan kos kitar hayat ke atas bangunan hijau di Malaysia. Data dianalisis menggunakan Pakej Statistik untuk Sains Sosial (SPSS). Terdapat dua keputusan penting yang diperolehi daripada analisis SPSS, analisis kekerapan dan indeks min. Kajian menunjukkan bahawa faedah dan cara- cara penggunaan pengekosan kitar hayat di bangunan hijau adalah ketara untuk menggalakkan kadar yang lebih tinggi di pembinaan bangunan hijau. Akan tetapi, sikap dan persepsi pengamal ke arah manfaat kewangan dalam pelaburan amalan hijau adalah sebab utama pengembangan bangunan hijau yang lambat di Malaysia.

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CHAPTER 1

INTRODUCTION

1.1. Research Background

Green building has become a flagship of sustainable development nowadays. It takes responsibility for balancing long-term economic, environmental and social health through using an integrated approach of design so that the negative impact of building on the environment and occupants is reduced. Besides positive impact on public health and environment, green building is designed to reduce operating costs, enhances building and organizational marketability, increases occupant productivity, and helps create a sustainable community (Hikmat H. Ali, 2009). Certain barriers to increase green building in practical have been addressed. There are relating to codes issue, education in sustainable construction, availability of sustainable materials, and financial consideration of the green developments.

Many organizations make acquisitions or investments of capital items simply on the basis of initial cost without appraised on the basis of their total lifetime cost (Woodward, 1997). Life cycle costing, one method of economic assessment which included environment consideration, seeks to optimize value of investment by taking consideration on sum of all significant cost involved in the lifetime of the project. The selection of investment after life cycle analysis will be more reliable and accuracy instead of initial cost consideration only.

According to Nannan Wang, environmental and low life cycle cost performance is the highest position on the ranking list of green building investments before decision made. Hence, the application of life cycle costing in Malaysia green building to promote higher adoption of green building is the primary consideration in this research.

1.2. Problem Statement

Green Building initiatives are predicated on the fact that benefits accrue over the life of the building. It focuses on increasing the efficiency of resource use (energy, water, and materials) while reducing building impact on human health and the environment during the building's life cycle through better sitting, design, construction, operation, maintenance, and removal. Therefore, green building is

designed and operated to reduce the overall impact of the built environment on its surroundings.

Green Building Index (GBI) is a rating tool developed specifically for the Malaysian tropical climate, environmental and development context, cultural and social needs. It is created to produce significant long-term benefits for building owners and occupants; as this system helps for solving existing building problems, limiting environmental impacts, creating healthier and more productive places and reducing building operations cost. Even with the support benefits of green building from the researches and GBI, the certified new green building in Malaysia not more than 30 (GBI, 2009). Thus, a question raise: the attractiveness of green buildings will be significant improve if those benefits come with cost.

Eventually, financial return is the basic consideration of investment with no doubt (M.H. Issa, 2010). This is because the financial benefits is the principle fundamental and the first consideration of all projects development. The project will be less favourable to developers/owners if less return from their estimation even though the project is environmentally sound. Hence, in sound to promote higher green buildings construction, adoption life cycle costing in building construction is the suit way.

The problem is how to verify the green buildings can optimise the value of money of investors and occupants. So that, an increasing of green buildings construction can brings in practices. The questions arise to suit the problem statement as below.

Does life cycle costing analysis bring significant benefits to green building development? The following questions that also arise in this study are: Does life cycle costing will help in optimizing the cost of green building investment? and What are the challenges and barriers of life cycle costing application in Malaysia green building? The overriding questions above will be answered through this study.

1.3. Aim of the Research

The aim of this research is to study the perception of life cycle costing in Malaysia green building developments.

1.4. Objectives

To achieve the aim, three objectives have been identified:-

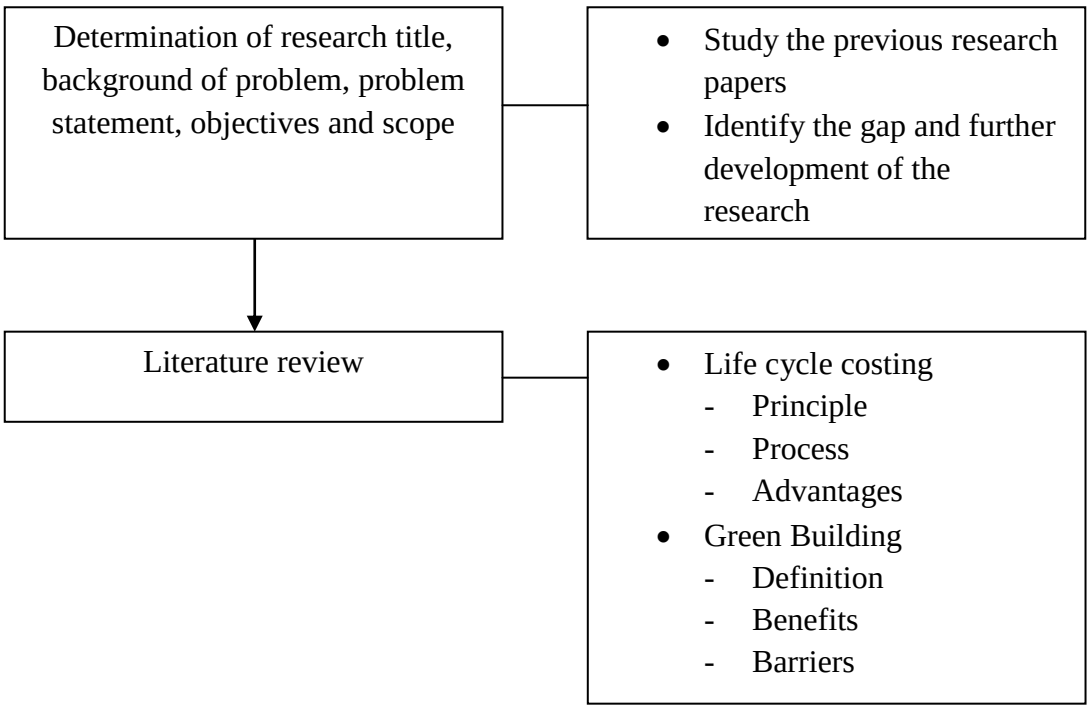
i. To investigate the benefits of life cycle costing application in green building;
ii. To identify ways of life cycle costing in optimizing the cost for green building;
iii. To determine the challenges and barriers of life cycle costing application in Malaysia green building.

1.5. Scope of the Research

The scope of this study focused on green buildings in Malaysia. The respondents were coming from the expert parties who involves in green building development and the post-graduate students with construction background.

1.6. Brief Research Methodology

Phase 1



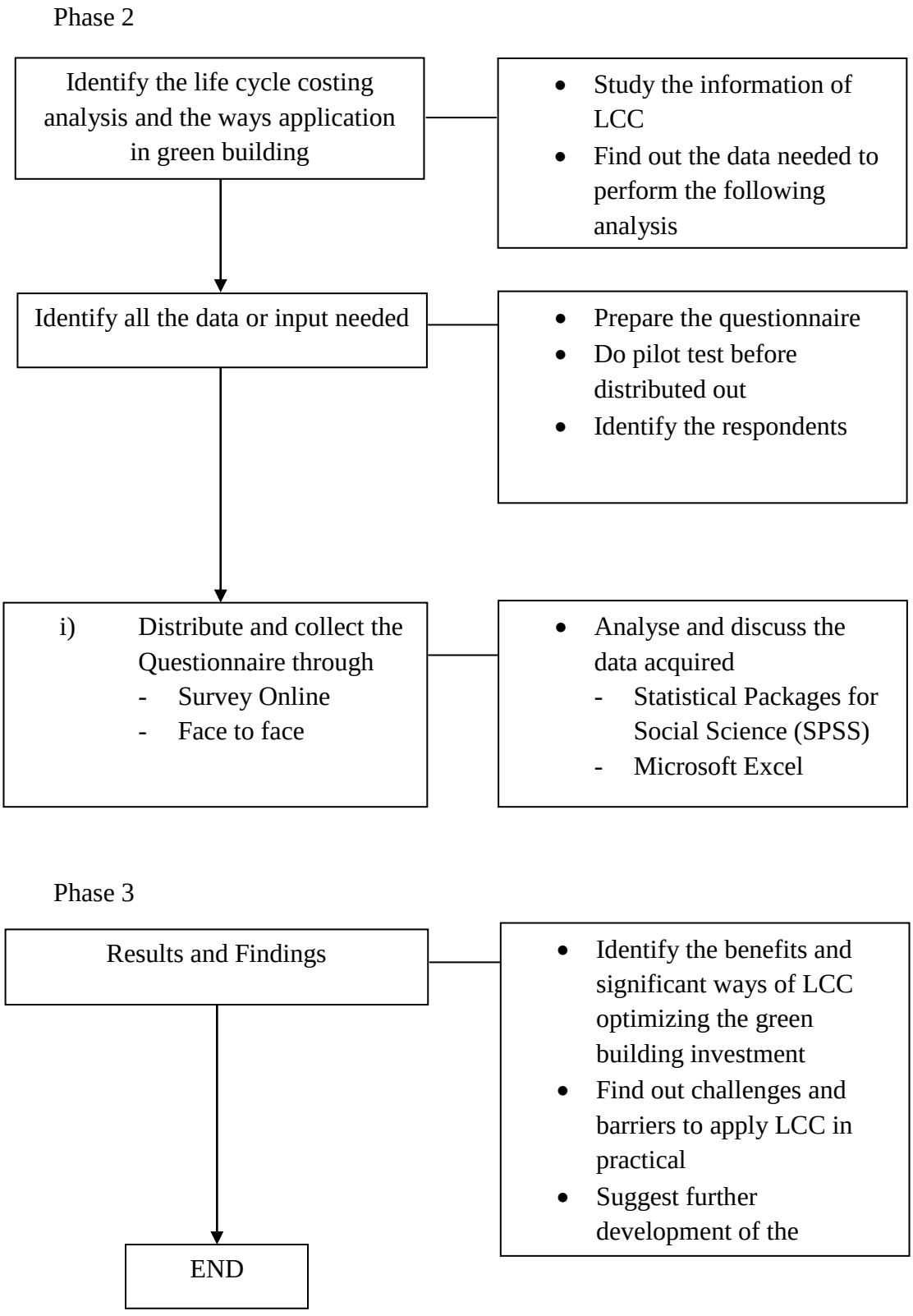


Figure 1.1: Flowchart Diagram of the Study Methodology

1.7. Expected Findings

In this study, there are three main objectives which lead into understanding of life cycle costing application in Malaysia green building.

The first expected finding will show the benefits of life cycle costing application in green building. This finding is important to promote developments of green building practices in Malaysia.

The second finding will identify the significant ways of life cycle costing in optimize the cost for green building investments. This finding will enable the building owner/ developer to alert on the steps to be taken in order to apply the life cycle costing in green building.

The third finding will identify the challenges and barriers of life cycle costing application in Malaysia green building. Through this finding, further considerations can be made to suit the difficulties and limitations on of life cycle costing application in Malaysia green building.